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[wherein the flushing signal causes said recording head to jet ink particles through said nozzle so that each of the ink particles is a main ink particle.

2/25. An ink-jet recording apparatus according to claim 24, wherein said flushing signal generating unit is operable to generate the flushing signal as a periodic signal.

3/26. An ink-jet recording apparatus according to claim 25, wherein said flushing signal generating unit is operable to generate the flushing signal as the periodic signal, the periodic signal having periodic pulses, wherein each of the periodic pulses has a trapezoidal waveform with a first inclined section, a potential maintaining section continuous with the first inclined section, and a second inclined section continuous with the potential maintaining section.

4/27. An ink-jet recording apparatus according to claim 26, wherein said flushing signal generating unit is operable to generate the flushing signal as the periodic signal, the periodic signal having the periodic pulses, wherein each of the periodic pulses has the trapezoidal waveform, and wherein a gradient of the first inclined section is greater than a gradient of the second inclined section.

5/28. An ink-jet recording apparatus according to claim 24, wherein said recording head is operable to jet the ink particles through said nozzle at a speed of 5 m/s or above.

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[29. An ink-jet recording apparatus comprising:
a flushing signal generating unit operable to generate a flushing signal; and
a recording head provided with a nozzle, said recording head being operable to jet ink particles through said nozzle based on the flushing signal,
wherein the flushing signal causes said recording head to jet ink particles through said nozzle so that each of the ink particles has a momentum greater than a predetermined value.

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An ink-jet recording apparatus according to claim ~~29~~¹³, wherein said flushing signal generating unit is operable to generate the flushing signal as a periodic signal.

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An ink-jet recording apparatus according to claim ~~30~~¹⁴, wherein said flushing signal generating unit is operable to generate the flushing signal as the periodic signal, the periodic signal having periodic pulses, wherein each of the periodic pulses has a trapezoidal waveform with a first inclined section, a potential maintaining section continuous with the first inclined section, and a second inclined section continuous with the potential maintaining section.

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~~32~~

An ink-jet recording apparatus according to claim ~~31~~¹⁵, wherein said flushing signal generating unit is operable to generate each of the periodic pulses with a duration of $25\ \mu\text{s}$, the first inclined section with a gradient of $10\ \text{V}/\mu\text{s}$, the potential maintaining section with a level of $20\ \text{V}$, and the second inclined section with a gradient of $9.6\ \text{V}/\mu\text{s}$.

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~~33~~

An ink-jet recording apparatus according to claim ~~32~~¹⁶, wherein said recording head is operable to the jet ink particles through said nozzle at a speed of $4\ \text{m/s}$ or above, and each of the ink jet particles has a weight of $10\ \text{ng}$ or above.

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~~34~~

An ink-jet recording apparatus comprising:
a flushing signal generating unit operable to generate a flushing signal; and
a recording head provided with a nozzle, said recording head being operable to jet ink particles through said nozzle based on the flushing signal,
wherein the flushing signal causes said recording head to intermittently jet the ink particles through said nozzle so that the ink particles include sets of a main ink jet particle and minute ink jet particles after the main ink particle, and the minute ink jet particles of a previous set combine with the main ink jet particle of a following set in a range of a predetermined distance from said nozzle.

²¹/~~35~~. An ink-jet recording apparatus according to claim ²⁰/~~34~~, wherein said flushing signal generating unit is operable to generate the flushing signal as a periodic signal.

²²/~~36~~. An ink-jet recording apparatus according to claim ²¹/~~35~~, wherein said flushing signal generating unit is operable to generate the flushing signal as the periodic signal, the periodic signal having periodic pulses, wherein each of the periodic pulses has a trapezoidal waveform with a first inclined section, a potential maintaining section continuous with the first inclined section, and a second inclined section continuous with the potential maintaining section.

²³/~~37~~. An ink-jet recording apparatus according to claim ²¹/~~35~~, wherein said flushing signal generating unit is operable to generate the flushing signal having a frequency of 10 kHz or above.

²⁴/~~38~~. An ink-jet recording apparatus according to claim ²⁰/~~34~~, wherein said recording head is operable to jet the ink particles through said nozzle at a speed of 8 m/s or above.

²⁵/~~39~~. An ink-jet recording apparatus according to claim ²⁰/~~34~~, wherein the predetermined distance from said nozzle is 2 mm.

⁶/~~40~~. An ink-jet recording apparatus according to claim ¹/~~24~~, further comprising a capping device operable to seal said nozzle of said recording head, wherein said capping device catches the ink particles jetted by said recording head through said nozzle based on the flushing signal.

⁷/~~41~~. An ink-jet recording apparatus according to claim ¹/~~24~~, further comprising:
a member having an opening opposite to which said nozzle of said recording head can be disposed; and
an ink absorbing member disposed on a side of a bottom part of the opening,
wherein the ink particles jetted by said recording head through said nozzle based on the flushing signal are caught by said ink absorbing member.

⁸
~~42~~. An ink-jet recording apparatus according to claim ¹~~24~~, wherein said recording head is provided with a plurality of nozzles respectively for different inks, and said flushing signal generating unit is operable to generate different flushing signals for said plurality of nozzles for jetting the different inks, respectively.

⁹
~~43~~. An ink-jet recording apparatus according to claim ¹~~24~~, further comprising a plurality of flushing regions, wherein said recording head is provided with a plurality of nozzles respectively for different inks, and said recording head is operable to jet ink particles of the different inks through said plurality of nozzles to be caught in said plurality of flushing regions, respectively.

¹⁰
~~44~~. An ink-jet recording apparatus according to claim ¹~~24~~, further comprising:
a fan operable to prevent a temperature rise of said ink-jet recording apparatus; and
a fan controller operable to stop said fan during a flushing operation in which said recording head jets ink particles through said nozzle.

¹¹
~~45~~. An ink-jet recording apparatus according to claim ¹⁰~~44~~, further comprising an ink absorbing member operable to absorb the ink particles jetted by said recording head through said nozzle based on the flushing signal, wherein said fan controller keeps said fan stopped at least until the ink particles jetted by said recording head through said nozzle based on the flushing signal arrive at or are caught by said ink absorbing member.

¹²
~~46~~. An ink-jet recording apparatus according to claim ¹~~24~~, wherein said flushing signal generating unit is operable to generate the flushing signal separate from a printing signal based on printing data.

¹³
~~47~~. An ink-jet recording apparatus according to claim ¹³~~29~~, wherein said recording head is provided with a plurality of nozzles respectively for different inks, and said flushing signal

generating unit is operable to generate different flushing signals for said plurality of nozzles for jetting the different inks, respectively.

¹⁹
~~48~~. An ink-jet recording apparatus according to claim ¹³~~29~~, further comprising a plurality of flushing regions, wherein said recording head is provided with a plurality of nozzles respectively for different inks, and said recording head is operable to jet ink particles of the different inks through said plurality of nozzles to be caught in said plurality of flushing regions, respectively.

²⁶
~~39~~. An ink-jet recording apparatus according to claim ²⁰~~34~~, wherein said recording head is provided with a plurality of nozzles respectively for different inks, and said flushing signal generating unit is operable to generate different flushing signals for said plurality of nozzles for jetting the different inks, respectively.

²⁷
~~50~~. An ink-jet recording apparatus according to claim ²⁰~~34~~, further comprising a plurality of flushing regions, wherein said recording head is provided with a plurality of nozzles respectively for different inks, and said recording head is operable to jet ink particles of the different inks through said plurality of nozzles to be caught in said plurality of flushing regions, respectively.